POWERLIGHT®

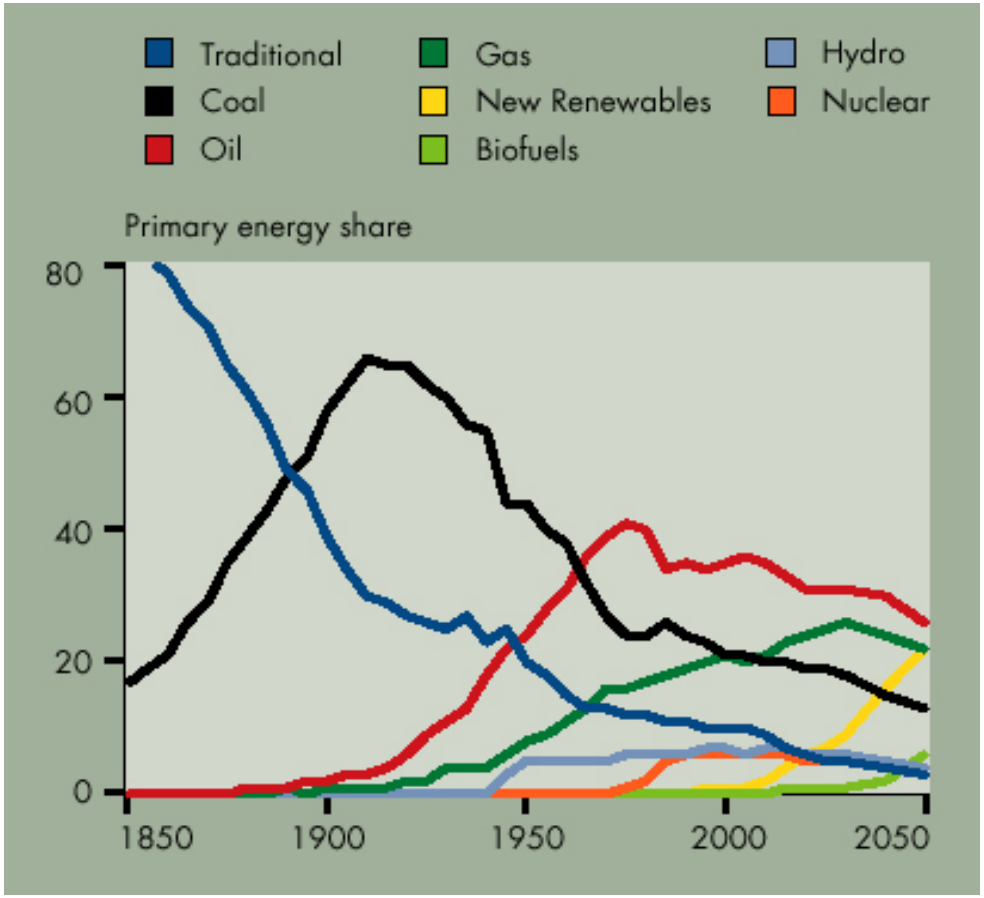
SOLAR ELECTRIC SYSTEMS

FEMP DG Workshop: Renewables
PowerLight Corporation

May 13, 2003

The Rise of Renewables

- Energy supplies are evolving from high to low carbon fuels
- Driven by demand for security, sustainability, environmental protection and climate change.
- New Renewables will supply an equal share of world energy supply as oil and gas by 2050



Source: Shell Oil Company.

Federal purchases of renewable energy or renewable energy systems will:

- Save the Federal Government $ - RE provides a hedge against fossil fuel price volatility because its fuel inputs are free
- Increase our energy independence – RE helps diversify our energy mix and reduces our reliance on imported oil and natural gas
- Improve local air quality and reduce greenhouse gas emissions – the production of RE is emission free
- Ensure the US RE industry remains competitive globally
- Increase the efficiency of existing T&D systems via implementation of distributed RE systems

PowerLight is a Worldwide Leader in Large-Scale Grid-tied PV Systems

- Focus:
  - PV systems manufacturer
  - Turnkey solutions provider
- Founded 1991
- High growth
  - 140% average growth per year since 1997
  - INC 500 listed for the past three years.
- Solid technology base ~ 50 US and international patents
- Profitable since inception

PV – Fastest Growing Electricity Source

- PV has grown at a 35% CAGR for the past five years
- Advantages:
  - **Peak power**
  - **Silent**
  - **Emissions free**
  - **Highly reliable**
  - **Distributed**
  - **Well suited to urban areas**
  - **Declining pricing**

37 kWp PowerGuard PV Installation
US Coast Guard Facility, Boston, MA

Grid-Connected PV

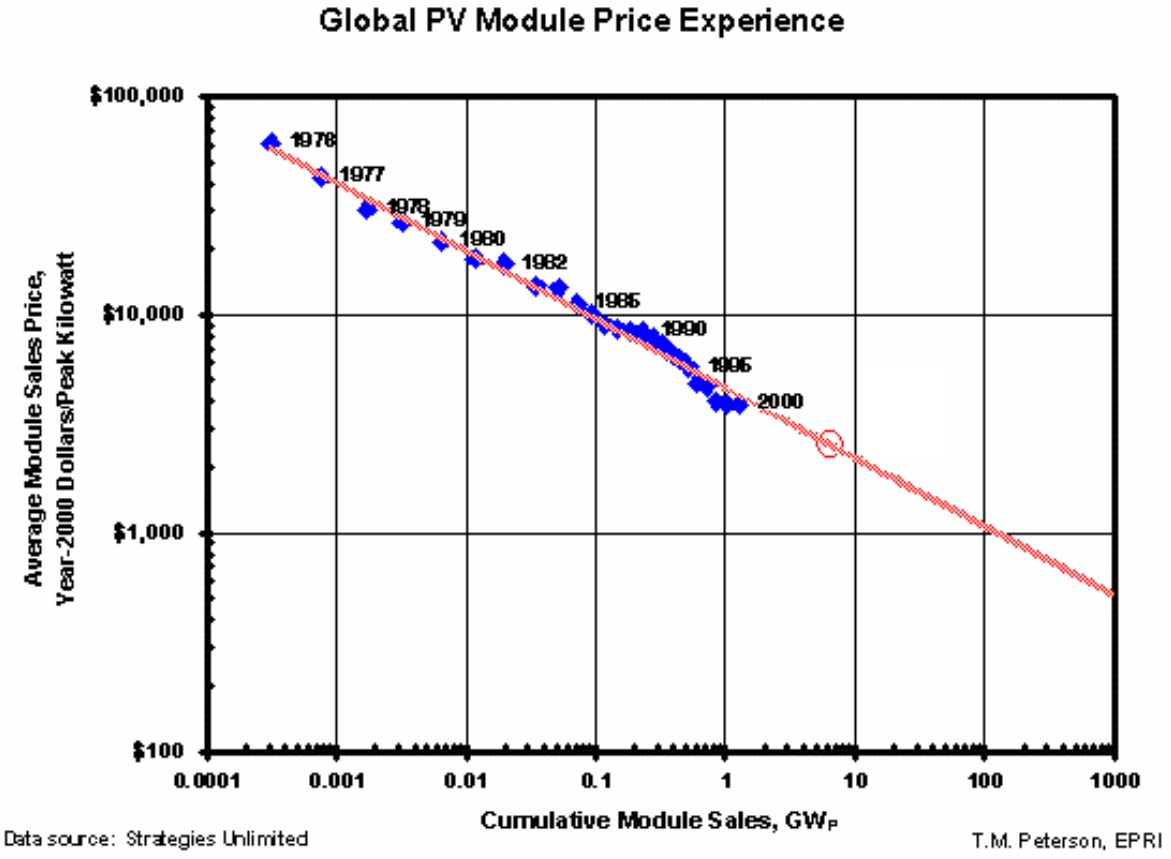
The Fastest Growing PV Segment

- **CAGR of 55% for the past 5 years - no sign of slowing**
- **Segment will exceed $3.1B by 2010**

924 kWp PowerShade PV Installation
US Navy, Coronado Island

470 kWp PowerGuard PV Installation
Franchise Tax Board, Sacramento, CA

PV Prices have fallen 10x in the Last 25 Years



Federal Agencies are eligible for State incentives: Example: CA State Rebate Incentive Programs

- Rebate incentives provide a cash payment to help offset the initial capital cost of the PV equipment

- Utility/region-specific programs
  - $4.50/watt up to 50% max of $4.5M (CPUC)
  - $6.00/watt up to 85% max of $2.0M (LADWP)

Database of State Incentives: http://www.dsireusa.org/

PowerLight's Products/Applications

Sloped PowerGuard

PowerGuard

PowerRoof

PowerShade

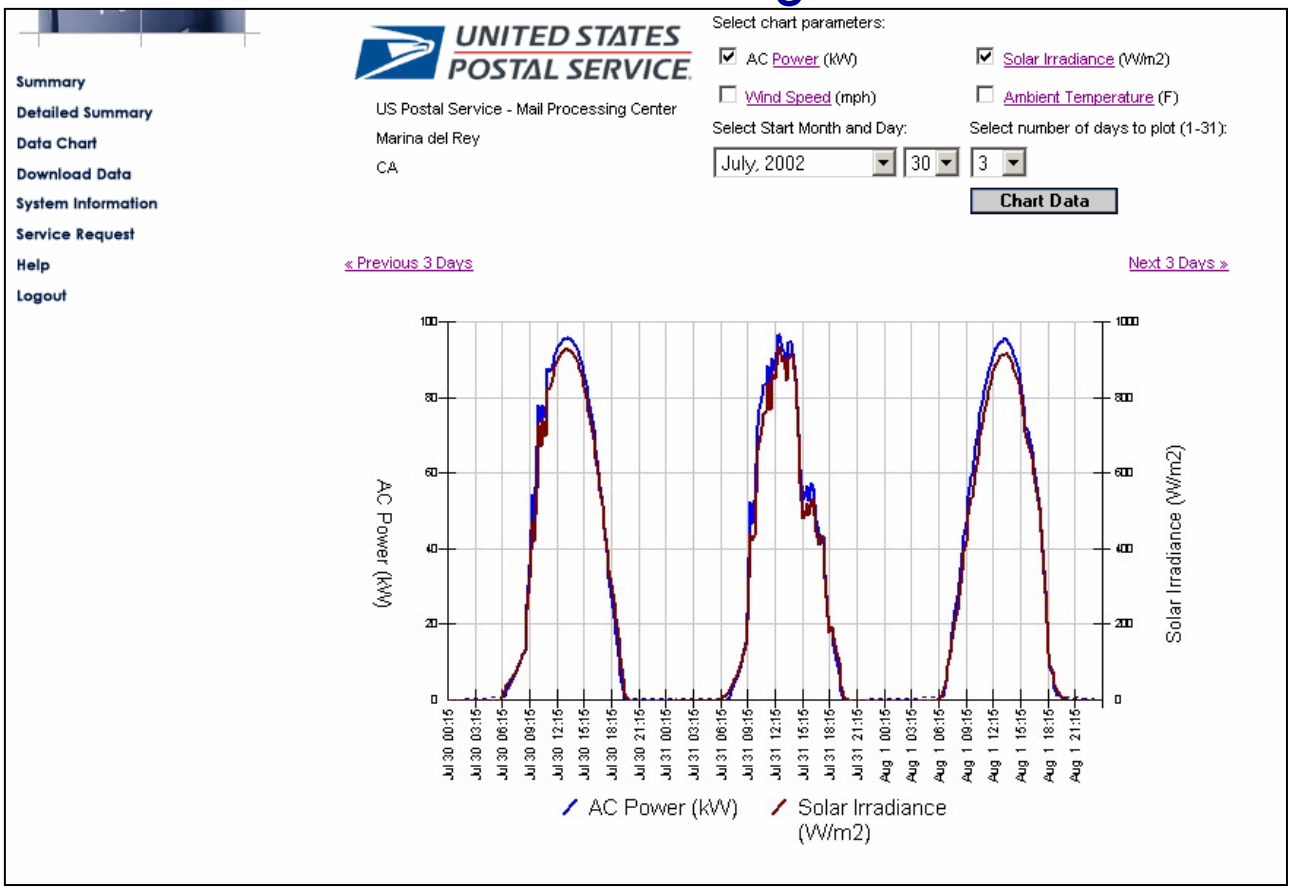
PowerTracker

Performance Monitoring for all Systems

Customer access via Internet

Optional display kiosk

Example of Performance Monitoring



Advantages of Clean, Reliable On-site PV Generation

- **Financially prudent**
  1) Zero fuel costs
  2) Financial hedge against fuel price increases
  3) Coincident with expensive "peak" electricity

- **Reliable**
  1) Proven
  2) 20- to 25-yr. warranties on power
  3) Virtually no maintenance

- **Clean**
  1) Zero emissions, 100% renewable
  2) Over-the-counter permitting

- **Popular**

High initial capital cost can be mitigated by optimizing the integration of PV into the facility

- PV and demand side management complement each other
  1) Clean kWh too precious to waste
  2) EMS - optimizes use of PV output
  3) Lengthen time horizon of demand reduction benefits

- Smart contracting strategy
  1) Single point of contact/accountability for end customer
  2) Lower administrative costs

- Showcase facilities as models for the future
  1) Greater control/operational flexibility of equipment
  2) Enhanced facility with reduced need for maintenance

Total project economics has several components

- Geographic location
  1) Amount of sun available
  2) Electricity rates, especially daytime and summer
  3) Local PV financial incentives
- Net system cost
  1) Initial system cost
  2) Maintenance costs (virtually none)
- Savings from total-system benefits
  1) Avoided purchases of utility electricity over 25 years
  2) Reduced roof maintenance costs
  3) Lower heating and air conditioning costs

PowerLight has installed more than 1.6 MW of solar at federal facilities nationwide

955 kW	U.S. Naval Base Coronado (2 projects)
308 kW	GSA Federal Building
127 kW	U.S. Postal Service
78 kW	U.S. Department of Energy (4 systems)
75 kW	Environmental Protection Agency
47 kW	U.S. Dept. of the Interior, National Park Service
37 kW	U.S. Dept. of Transportation, Coast Guard
35 kW	U.S. Dept. of Commerce
1,662 kW	

U.S. Navy

- Naval Base
  Coronado, CA
- 924 kW carport and
  31 kW rooftop systems
- Completed May 2003

General Services Administration
Federal Building

- Los Angeles, CA
- 308 kW peak
- Sloped PowerGuard
- Completed May 2003

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U.S. Postal Service

- Marina del Rey, CA
- 127 kW peak
- PowerGuard
- Completed Nov. 2001

U.S. Department of Energy (Western Area Power Administration)

- Folsom, CA
- Four systems, totaling 78 kW peak
- PowerGuard
- Completed June 1998

Environmental Protection Agency
National Computer Center

- Research Triangle, NC
- 75 kW peak
- PowerGuard
- Completed February 2002

U.S. Dept. of the Interior
National Park Service

- Yosemite, CA
- 47 kW peak
- PowerGuard
- Completed October 2001

U.S. Department of Transportation,
Coast Guard Partnership through GSA

- Boston, MA
- 37 kW peak
- PowerGuard
- Completed Sept. 1999

U.S. Department
of Commerce
(NIST Headquarters)

- Gaithersburg, MD
- 35 kW peak
- PowerGuard
- Completed Sept. 2001


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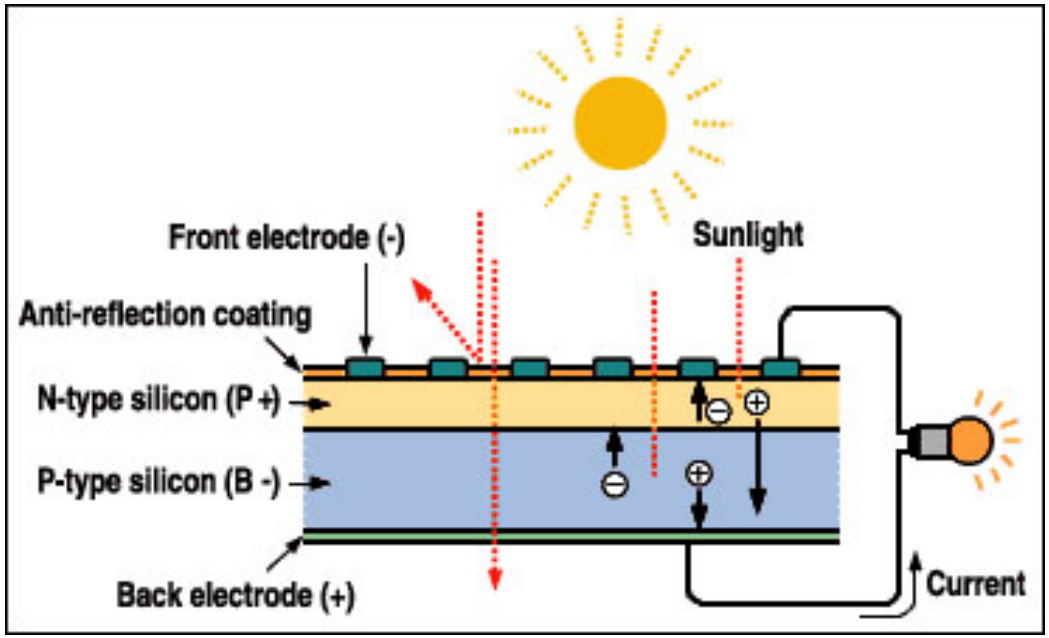
PV Technology Fundamentals

- Sunlight excites electrons in PV
- Excited electrons concentrate on one side of cell
- Concentration of charge creates polarity
- Connecting positive and negative sides across a circuit creates electricity

The Photovoltaic Effect



Who Uses PowerLight Systems?